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10/807,701	03/23/2004	Gadiel Seroussi	200309194-1	5596

22879 7590 01/29/2007	EXAMINER
HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400	ALHIJA, SAIF A

ART UNIT	PAPER NUMBER
2128	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date *3/23/04*.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

1.   Claims 1-20 have been presented for examination.

Information Disclosure Statement

2.   The information disclosure statement filed **23 March 2004** fails to comply with 37 CFR

1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature

publication or that portion which caused it to be listed; and all other information or that portion which

caused it to be listed. It has been placed in the application file, but the information referred to therein has

not been considered. **Reference 1R has no date and is unintelligible.**

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition
> of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

MPEP 2106 recites:

The claimed invention as a whole must accomplish a practical application. That is, it must

produce a "useful, concrete and tangible result" State Street 149 F.3d at 1373, 47 USPQ2d at 1601-02. A

process that consists solely of the manipulation of an abstract idea is not concrete or tangibles. See In re

Warmerdam, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed.Cir. 1994). See also Schrader, 22 F.3d at

295, 30 USPQ2d at 1459.

3.   **Claims 1-20 are rejected** under 35 U.S.C. 101 because the claimed invention is directed to non-

statutory subject matter.

     i)   The claims recite the steps of partitioning and outputting of strings, creating a tree

structure and nodal analysis of the tree. The claims are drawn to a series of abstract mathematical steps. In

addition, the partitioning and outputting of strings, creating a tree structure and nodal analysis of the tree

appear to be a mere manipulation of data. As such the claims do not produce a useful, concrete, and

tangible result.

    ii)   Claim 17 recites the phrase "ending the process if none of the nodes of the tree are

unused." If this analysis were positive the claim would recite creating a tree structure, and setting nodes to

a certain value. As such the claim would result in a mere manipulation of data and therefore would not

produce a useful, concrete, and tangible result.

    iii)   Claim 14 recites a mixing of statutory classes as the preamble states "a medium" which is

an article of manufacture as well as a process.

    iv)   The claims recite a computer program. It should be noted that code (i.e., a computer

software program) does not do anything per se. Instead, it is the code stored on a computer that, *when

executed*, instructs the computer to perform various functions. The following claim is a generic example

of a proper computer program product claim;

A computer program product embodied on a computer-readable medium and comprising code

that, when executed, causes a computer to perform the following:

               Function A
               Function B
               Function C, etc...

Appropriate correction is required.

All claims dependent upon a rejected base claim are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis

for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or
in public use or on sale in this country, more than one year prior to the date of application for
patent in the United States.

4.   **Claims 1-10, and 14-20 are rejected** under 35 U.S.C. 102(b) as being clearly anticipated by

Savari "Renewal Theory and Source Coding," hereafter referred to as Savari.

Regarding Claim 1:

The reference discloses A process for simulating an input sequence comprising:

partitioning the input sequence into a partition including a set of substrings and a tail,

wherein the substrings have lengths that are not all equal; **(Paragraph 17 of Applicants**

specification states that the Lempel-Ziv incremental parsing rule will result in a partition

that is "sure to provide substrings of different lengths." Lempel Ziv is discussed in Savari

on Page 1695, Right Column, Paragraph 3)

and

outputting the substrings in a random order to generate an output sequence. **(Savari.**

Page 1695, Right Column, Paragraph 3)

Regarding Claim 2:

The reference discloses The process of claim 1, wherein the tail is selected from the group

consisting of an empty string and the substrings of the partition. **(Savari. Page 1696, Left Column,**

Paragraph 3, "empty string")

Regarding Claim 3:

The reference discloses The process of claim 1, wherein partitioning the sequence comprises

selecting each of the substrings to consist of one or more consecutive symbols from the input sequence,

where each of the substrings differs from the other substrings of the partition. **(Savari. Page 1695, Right Column, Paragraph 3. Unequal lengths implies different)**

Regarding Claim 4:

The reference discloses The process of claim 1, wherein for each substring, the substring is a shortest sub-sequence of consecutive symbols from the input sequence such that the substring differs from all of the substrings that are in the partition and preceding in the input sequence. **(Savari. Page 1695, Right Column, Paragraph 3. This limitation is an aspect of Lempel Ziv)**

Regarding Claim 5:

The reference discloses The process of claim 4, further comprising:

drawing a random integer from a range of [Tx[integers, where ITxl is the number of sequences in a set Tx such that for each sequence in the set Tx, a partition of the sequence into substrings such that each substring is a shortest sub-sequence of symbols from the sequence that differs from all of the substrings of the partition that are preceding in the sequence includes a set of substrings that is equal to the set of the substrings in the partition of the input sequence; and **(Savari. Page 1695, Right Column, Paragraph 3. Random Output)**

mapping the random integer to a corresponding one of the sequences in set Tx, wherein the sequence corresponding to the random integer defines the random order for outputting the substrings. **(Savari. Page 1695, Right Column, Paragraph 3. Random Output)**

Regarding Claim 6:

The reference discloses The process of claim 1, wherein outputting the substrings comprises:

organizing the substrings in a tree having multiple levels, wherein each of the levels contains substrings of equal length, and branches between any two of the levels connect each substring in a higher of the two levels to a substring that results from deleting a last symbol of the substring; **(Savari. Page 1698, Left Column, Paragraph 1-2)**

designating the substrings in the partition as available; **(Savari. Page 1698, Left Column, Paragraph 1-2)**

selecting one of the substrings as a current substring; **(Savari. Page 1698, Left Column, Paragraph 1-2)**

randomly selecting one of the branches from the current substring to the substrings in a higher one of the levels of the tree, wherein each of the branches from the current substring has a probability of being taken that depends on how many available uses there are of the substrings that are connected through the branch to the current substring; **(Savari. Page 1695, Right Column, Paragraph 3. Random Output)**

changing the current substring to the substring at an end of the branch selected; **(Savari. Page 1698, Left Column, Paragraph 1-2)**

in response to the current substring not being available, repeating selection of one of the branches from the current substring and changing the current substring to the substring at the end of the branch selected; otherwise**(Savari. Page 1698, Left Column, Paragraph 1-2)**

outputting the current substring; and **(Savari. Page 1698, Left Column, Paragraph 1-2)**

marking the current substring as used. **(Savari. Page 1698, Left Column, Paragraph 1-2) (Claim Interpretation. The steps indicated above appear to be a process of tree parsing and parsability as discussed in the reference on Page 1698, Left Column, Paragraph 1-2)**

Regarding Claim 7:

The reference discloses The process of claim 6, wherein selecting one of the substrings as the current substring comprises selecting an empty string as the current substring. **(Savari. Page 1698, Left Column, Paragraph 1-2. Null root)**

Regarding Claim 8:

The reference discloses The process of claim 6, wherein marking the current substring as used changes the string from being available to being unavailable. **(Savari. Page 1698, Left Column, Paragraph 1-2. Path parsability/probability)**

Regarding Claim 9:

The reference discloses The process of claim 6, wherein marking the current substring as used reduces available uses of the current substring. **(Savari. Page 1698, Left Column, Paragraph 1-2. Path parsability/probability)**

Regarding Claim 10:

The reference discloses The process of claim 6, wherein the probability of each of the branches being taken is equal to a ratio of a total of the available uses of the substrings that are connected through the branch to the current substring and a total of available uses of the substrings that are connected through all of the branches connecting the current substring to higher levels in the tree. **(Savari. Page 1698, Left Column, Paragraph 1-2. Path parsability/probability)**

Regarding Claim 14:

The reference discloses A medium storing a computer program that implements a process comprising:

partitioning an input sequence into a partition including a set of substrings and a tail, wherein the substrings have lengths that are not all equal; **(Paragraph 17 of Applicants specification states that the Lempel-Ziv incremental parsing rule will result in a partition that is "sure to provide substrings of different lengths." Lempel Ziv is discussed in Savari on Page 1695, Right Column, Paragraph 3)** and

outputting the substrings in a random order to generate an output sequence. **(Savari on Page 1695, Right Column, Paragraph 3)**

Regarding Claim 15:

The reference discloses The medium of claim 14, wherein each of the substrings is a shortest sub-sequence of consecutive symbols from the input sequence such that the substring differs from all of the substrings that are in the partition and preceding in the input sequence, and the process implemented by the computer program further comprises:

drawing a random integer from a range of $[Tx[$ integers, where $[Tx[$ is the number of sequences in a set Tx such that for each sequence in the set Tx, a partition of the sequence into substrings such that each substring is a shortest sub-sequence of symbols from the sequence that differs from all of the substrings of the partition that are preceding in the sequence includes a set of substrings that is equal to the set of the substrings in the partition of the input sequence; **(Savari. Page 1695, Right Column, Paragraph 3. Random Output)** and

mapping the random integer to a corresponding one of the sequences in the set Tx, wherein the sequence corresponding to the random integer defines the random order for outputting the substrings. **(Savari. Page 1695, Right Column, Paragraph 3. Random Output)**

Regarding Claim 16:

The reference discloses The medium of claim 14, wherein outputting the substrings comprises:

organizing the substrings in a tree having multiple levels, wherein each of the levels

contains substrings of equal length, and branches between any two of the levels connect each substring in

a higher of the two levels to a substring that results from deleting a last symbol of the substring; **(Savari.**

Page 1698, Left Column, Paragraph 1-2)

designating the substrings in the partition as available; **(Savari. Page 1698, Left**

Column, Paragraph 1-2)

selecting one of the substrings as a current substring; **(Savari. Page 1698, Left Column,**

Paragraph 1-2)

randomly selecting one of the branches from the current substring to the substrings in a

higher one of the levels of the tree, wherein each of the branches from the current substring has a

probability of being taken that depends on how many available uses there are of the substrings that are

connected through the branch to the current substring; **(Savari. Page 1695, Right Column, Paragraph 3.**

Random Output)

changing the current substring to the substring at an end of the branch selected; **(Savari.**

Page 1698, Left Column, Paragraph 1-2)

in response to the current substring not being available, repeating selection of one of the

branches from the current substring and changing the current substring to the substring at the end of the

branch selected; otherwise **(Savari. Page 1698, Left Column, Paragraph 1-2)**

outputting the current substring; **(Savari. Page 1698, Left Column, Paragraph 1-2)** and

marking the current substring as used. **(Savari. Page 1698, Left Column, Paragraph 1-**

2) (Claim Interpretation. The steps indicated above appear to be a process of tree parsing and

parsability as discussed in the reference on Page 1698, Left Column, Paragraph 1-2)

Regarding Claim 17:

The reference discloses A process for generating a simulated sequence, comprising:

creating a tree structure having nodes that correspond to substrings resulting from parsing an input sequence, wherein all of the nodes except a root node are initially designated as being unused; **(Savari. Page 1698, Left Column, Paragraph 1-2)**

setting a current node equal to the root node; **(Savari. Page 1698, Left Column, Paragraph 1-2)**

ending the process if none of the nodes of the tree structure are unused; **(Savari. Page 1698, Left Column, Paragraph 1-2)**

in response to the current node being unused, outputting a substring corresponding to the current node as part of the simulated sequence, designating the current node as being used, and setting the current node equal to the root node; and **(Savari. Page 1698, Left Column, Paragraph 1-2)**

in response to current node being used, selecting a branch from the current node to one of the nodes in a higher level of the tree structure and setting the current node to the node at an upper end of the selected branch. **(Savari. Page 1698, Left Column, Paragraph 1-2)**

(Claim Interpretation. The steps indicated above appear to be a process of tree parsing and parsability as discussed in the reference on Page 1698, Left Column, Paragraph 1-2)

Regarding Claim 18:

The reference discloses The process of claim 17, wherein the substrings resulting from parsing the input sequence comprises the substrings from parsing the input sequence according to the Lempel-Ziv incremental parsing rule. **(Savari. Page 1695, Right Column, Paragraph 3)**

Regarding Claim 19:

The reference discloses The process of claim 17, wherein the input sequence comprises a binary sequence, and selecting the branch from the current node comprises:

selecting a first branch from the current node if a second branch from the current node is blocked; **(Savari. Page 1698, Left Column, Paragraph 1-2. Parsability)** and

selecting the second branch from the current node if the first branch from the current node is blocked. **(Savari. Page 1698, Left Column, Paragraph 1-2. Parsability)**

Regarding Claim 20:

The reference discloses The process of claim 17, wherein the input sequence comprises a binary sequence, and selecting the branch from the current node comprises selecting a branch Vb, wherein branch index b is a randomly drawn bit with a probability of being 1 equal to $U(V1)/[U(V0)+U(V1)]$, $U(V1)$ is a number of unused nodes on a branch V1 from the current node, and $U(V0)$ is a number of unused nodes on a branch V0 from the current node. **(Savari. Page 1698, Left Column, Paragraph 1-2. Path parsability/probability)**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966),

that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are

summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5.   **Claim(s) 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savari in view of**

Sakarya et al. "An Evaluation of SAR Image Compression Techniques," hereafter referred to as

Sakarya.

Regarding Claim 11:

Savari does not explicitly disclose The process of claim 1, further comprising:

generating the input sequence from an ordering of pixel values in a digital representation

of a texture; and

generating a digital representation of a simulation of the texture from the output

sequence.

However, Sakarya discloses The process of claim 1, further comprising:

generating the input sequence from an ordering of pixel values in a digital representation

of a texture; **(Sakarya. Page 2833, Introduction, Paragraph 2 as well as Section 2, Paragraph**

1-2) and

generating a digital representation of a simulation of the texture from the output

sequence. (Sakarya. Page 2833, Introduction, Paragraph 2 as well as Section 2, Paragraph 1-2)

Savari and Sakarya are analogous art in that they both deal with lossless data compression

algorithms.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize

the process of claim 1, defined as the well known Lempel-Ziv compression algorithm in Savari, for the

texture representation in Sakarya in order to offer a practical solution for the prevention of deterioration

of system performance (Sakarya. Page 2833, Introduction, Paragraph 1)

5.   Claim(s) 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savari in

view of El-Maleh et al. "A Geometric Primitives Based Compression Scheme for Testing Systems

on a Chip" hereafter referred to as El-Maleh.

Regarding Claim 12:

Savari does not explicitly disclose The process of claim 1, further comprising:

generating the input sequence from measurements of a first system; and

using the output sequence for testing of a second system.

However, El-Maleh discloses The process of claim 1, further comprising:

generating the input sequence from measurements of a first system; (El-Maleh. Page

55, Left Column, Paragraph 1 and Last Paragraph) and

using the output sequence for testing of a second system. (Claim Interpretation. This

limitation is drawn to an intended use and is therefore not afforded patentable weight. However, in

the interests of compact prosecution the claim will be interpreted as though Applicants have

resolved the intended use.) (El-Maleh. Page 55, Left Column, Paragraph 1 and Last Paragraph)

Savari and **El-Maleh** are analogous art in that they both deal with lossless data compression

algorithms.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize

the process of claim 1, defined as the well known Lempel-Ziv compression algorithm in **Savari**, for the

system on chip testing in **El-Maleh** in order to decrease testing time by decreasing test data. **(El-Maleh.**

Page 54, Introduction, Paragraph 2)

Regarding Claim 13:

Savari does not explicitly disclose The process of claim 1, wherein outputting the substrings in

a random order to generate the output sequence is performed in a computer.

However, El-Maleh discloses The process of claim 1, wherein outputting the substrings in a

random order to generate the output sequence is performed in a computer.

Savari and **El-Maleh** are analogous art in that they both deal with lossless data compression

algorithms.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize

the process of claim 1, defined as the well known Lempel-Ziv compression algorithm in **Savari**, on a

computer as shown in **El-Maleh** since a data compression algorithm is complex and would require the

speed and resources of a computer in order to be an efficient means of compression. **(El-Maleh. Page 54,**

Introduction, Paragraph 3)

Conclusion

7.   All Claims are rejected.

8.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saif A. Alhija whose telephone number is (571) 272-8635. The examiner can normally be reached on M-F, 11:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAA

January 19, 2007

KAMINI SHAH
SUPERVISORY PATENT EXAMINER